

## CLAIMS

What is claimed is:

1. An apparatus to aid the loading and unloading of flexographic plates to and from an imager, comprising:

a magazine containing a plurality of compartments each for holding a single flexographic plate, the compartments arranged vertically, and movable in a vertical direction, each respective compartment having a respective rest vertical position at a rest horizontal position, each respective compartment further having a loading vertical position at which the respective compartment is at a height for loading onto the imager;

a lifting mechanism to lift and lower the compartments; and

a control system to control the lifting and lowering by the lifting mechanism,

such that a particular compartment is moved from its rest vertical position at a rest horizontal position to a loading vertical position at which the particular compartment is at a height for loading onto the imager or unloading from the imager, and when the particular compartment is at its loading vertical position, the particular compartment is movable horizontally from and to the rest horizontal position to and from a loading horizontal position suitable for loading and unloading the plate on the compartment onto and from the imager,

the apparatus further comprising:

an automatic plate loader to remove the plate from the particular compartment and load the plate onto the imager.

2. An apparatus as recited in claim 1; wherein the automatic plate loader removes the plate from the particular compartment at the plate's loading horizontal position.

3. An apparatus as recited in claim 1, wherein the automatic plate loader partially removes the plate from the particular compartment prior to the plate being moved to the plate's loading horizontal position.
4. An apparatus as recited in claim 1, wherein each compartment is for a single flexographic plate that may be covered by a protective sheet, and wherein the automatic plate loader includes an automatic protective sheet remover to remove the protective sheet when such a sheet is included on the plate, the removing prior to or during the loading of the plate onto the imager.
5. An apparatus as recited in claim 1, wherein the lifting mechanism is operative to lift and lower the magazine of compartments, and wherein the control system controls the lifting and lowering of the magazine until a selected one of the compartments is at its loading vertical position.
6. An apparatus as recited in claim 1, wherein the lifting mechanism is operative to lift and lower the compartments of the magazine one compartment at a time.
7. An apparatus as recited in claim 6, wherein the respective rest positions of each of the compartments are lower than the loading vertical position such that a particular compartment pre-loaded with a plate is lifted from its rest vertical position to the loading vertical position, then moved while at the loading vertical position to the loading horizontal position for loading onto the imager.
8. An apparatus as recited in claim 1, wherein the lifting mechanism is further operative to lift or lower the particular compartments from the loading vertical position after the plate is imaged and unloaded from the imager to the particular compartment's respective imaged vertical position.
9. An apparatus as recited in claim 1, wherein the magazine comprises at least 10 compartments.
10. An apparatus as recited in claim 4, wherein the automatic plate loader includes:  
a first mechanism including a first set of vacuum holders under control of the control system, the first mechanism movable to move a plate in the particular

compartment to an intermediate horizontal position, the first mechanism under control of the control system further movable to move the plate from the intermediate horizontal position to an imager loading position.

11. An apparatus as recited in claim 10, wherein the compartment is moved to its loading horizontal position, and wherein the automatic plate loader moves the plate to the intermediate horizontal position when the compartment is in the loading horizontal position.

12. An apparatus as recited in claim 10, wherein the moving to the intermediate horizontal position is when the compartment is in its rest horizontal position, and wherein the automatic plate loader moving the plate from the intermediate horizontal position to an imager loading position includes moving the compartment from its rest horizontal position to its loading horizontal position.

13. An apparatus as recited in claim 10,  
wherein the imager is a drum imager that includes rotatable drum and a clamp on the drum to clamp a plate thereto,

wherein the plate has a top side and a bottom side, and when at the intermediate horizontal position, a front edge close to the imager, and a far edge furthest from the imager, and

wherein the automatic plate loader further includes:

a second mechanism including a second set of vacuum holders under control of the control system, the second mechanism movable under control of the control system and in the case that the plate includes a protective sheet on the top side, to hold the bottom of the plate at the intermediate horizontal position,

the first mechanism further movable under control of the control system and in the case that the plate includes a protective sheet on the top side, to separate a small strip of the protective sheet along the front edge away from the plate while the second mechanism holds the bottom of the plate at the intermediate horizontal position,

wherein the second mechanism under control of the control system and in the case that the plate includes a protective sheet on the top side, is further to let go of the bottom of the plate after the first mechanism has separated the edge of the protective sheet,

wherein the first mechanism under control of the control system and in the case that the plate includes a protective sheet on the top side, is to move the plate to the imager loading position after the second mechanism has let go of the bottom of the plate such that the clamp of the drum may grab the front edge of the plate without the protective sheet thereon,

such that after the clamp has grabbed the front edge of the plate, rotating the drum separates the sheet from the plate and loads the plate onto the drum.

14. An apparatus as recited in claim 13,

wherein the automatic plate loader further includes a bending apparatus that under control of the control system automatically moves across the front edge of the plate to loosen the protective sheet from the plate in the case the plate includes a protective sheet thereon and when the plate is at the intermediate horizontal position.

15. An apparatus as recited in claim 13,

wherein the automatic plate loader further includes an antistatic device to remove static electricity to ease separation of the protective sheet from the plate.

16. A method of loading a flexographic plate to an imager, the method comprising:

(a) pre-loading a particular flexographic plate into a particular compartment of a magazine containing a plurality of compartments each for holding a single flexographic plate, the compartments arranged vertically, and movable in a vertical direction, each respective compartment having a respective rest vertical position at a rest horizontal position, each respective compartment further having a loading vertical position at which the respective compartment is at a height for loading onto the imager or unloading from the imager,

(b) lifting or lowering the particular compartment from its rest vertical position at its rest horizontal position to its loading vertical position,

(c) moving the particular compartment when at its loading vertical position from and to its rest horizontal position to and from a loading horizontal position suitable for loading and unloading the plate on the compartment onto and from the imager, and

(d) automatically removing the plate from its compartment at the loading horizontal position and loading the plate onto the imager.

17. A method as recited in claim 16, wherein each compartment is for single flexographic plate that may be covered by a protective sheet, and wherein step (d) includes automatically removing the protective sheet when such a sheet is included on the plate, the removing prior to or during the loading of the plate onto the imager.
18. A method as recited in claim 16, wherein step (b) includes lifting or lowering the magazine of compartments until the particular compartment of the particular flexographic plate is at its loading vertical position.
19. A method as recited in claim 16, wherein step (b) includes lifting or lowering only the particular compartment of the magazine on the basis of one compartment being lifted or lowered at a time.
20. A method as recited in claim 19, wherein the respective rest positions of each of the compartments are lower than the loading vertical position such that step (b) includes lifting the pre-loaded particular compartment from its rest vertical position to the loading vertical position, then moving the particular compartment while at the loading vertical position to the loading horizontal position for loading the plate onto the imager.
21. A method as recited in claim 16, further comprising:

lifting or lowering the particular compartment from the loading vertical position after the plate is imaged and unloaded from the imager to an imaged vertical position for the particular compartment.

22. A method as recited in claim 16, wherein step (a) includes pre-loading the particular compartment with a pre-sensitized CTP flexographic plate such that as a result of the pre-loading, the particular plate is in the compartment without a cover sheet.
23. A method as recited in claim 16, further comprising transporting the magazine from a storage location to an imaging location adjacent to the imager.
24. A method as recited in claim 16, wherein the magazine comprises at least 10 compartments.
25. A method as recited in claim 17, wherein step (d) further includes:  
moving the plate in the particular compartment from its position when the compartment is in the loading horizontal position to an intermediate horizontal position, and  
moving the plate from the intermediate horizontal position to an imager loading position where the plate is loaded onto the imager.
26. A method as recited in claim 25,  
wherein the imager is a drum imager that includes rotatable drum and a clamp on the drum to clamp a plate thereto,  
wherein the plate has a top side and a bottom side, and when at the intermediate horizontal position, the plate has a front edge close to the imager, and a far edge furthest from the imager, and  
wherein step (d) further includes:  
in the case that the plate includes a protective sheet on the top side, holding the bottom of the plate at the intermediate horizontal position,  
separating a small strip of the protective sheet along the front edge away from the plate while the bottom of the plate is held at the intermediate horizontal position,  
after the separating, letting go of the bottom of the plate,

moving the plate to the imager loading position after the letting go of the bottom of the plate, and

clamping the front edge of the plate without the protective sheet thereon, such that after the clamping, rotating the drum separates the sheet from the plate and loads the plate onto the drum.

27. A method as recited in claim 26, wherein step (d) further includes:

in the case the plate includes a protective sheet thereon and when the plate is at the intermediate horizontal position prior to the holding of the bottom of the plate at the intermediate horizontal position, bending the front edge of the plate to loosen the protective sheet from the plate.

28. A method as recited in claim 26, wherein step (d) further includes:

in the case the plate includes a protective sheet thereon, removing static electricity to ease separation of the protective sheet from the plate.